SEQUENCE LISTING

<110> Københavns Universitet
        Louise Jørgensen
        Pamela Magistrado
        Thomas Lavstsen
        Ali Salanti
        Morten A. Nielsen
        Trine Staalsø
        Lars Hviid
        Thor Theander
        Anja Jensen

<120> COMPOUNDS USEFUL IN THE DIAGNOSIS AND TREATMENT OF MALARIA

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 25  Asn Leu Gly Gly Gln Gly Asn Thr Leu Asn Gly Asp Ile Cys Lys Ile
     785                 790                 795                 800
     Thr Lys Asn His Thr Asn Asp Ser Arg Pro Asn Gly Glu Pro Cys Thr
                 805                 810                 815
     Gly Lys Asp Lys Val Lys Asn Gly Phe Arg Leu Lys Ile Gly Thr Pro
 30              820                 825                 830
     Trp Thr Asn Ile Val Gln Lys Lys Lys Lys Ser Tyr Lys Asp Phe
             835                 840                 845
     Tyr Leu Pro Pro Arg Arg Gln His Met Cys Thr Ser Asn Leu Glu Asn
             850                 855                 860
 35  Leu Ser Thr Ser Ser Lys Gly Leu Ser Asn Gly Ser Phe Ala Ser His
     865                 870                 875                 880
     Ser Leu Leu Gly Asp Val Leu Leu Ala Ala Lys Phe Glu Ala Gln Lys
                 885                 890                 895
     Ile Ile Leu Val Tyr Lys Asn Lys Asn Asn Ile Asn Ile Arg Lys Arg
 40              900                 905                 910
     Ile Thr Asp Pro Asn Asp Gln Ala Thr Val Cys Arg Ala Ile Arg Tyr
             915                 920                 925
     Ser Phe Ala Asp Leu Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Asn
             930                 935                 940
 45  Ile Asn Ser Asp Ala Lys Asp Leu Gln Asp Arg Leu Glu Lys Ile Phe
     945                 950                 955                 960
     Lys Thr Ile Asn Glu Lys Leu Pro Asn Glu Ile Gln Lys Arg Tyr Thr
                 965                 970                 975
     Asn Arg Glu Asn Lys His Leu Asp Leu Arg Ser Asp Trp Trp Glu Ala
 50              980                 985                 990
     Asn Arg His Gln Val Trp Arg Ala Met Lys Cys Ala Thr Lys Gly Ile
             995                 1000                1005
     Ser Asn Asn Asn Cys Asn Gly Ile Pro Ile Glu Asp Tyr Ile Pro Gln
             1010                1015                1020
 55  Arg Leu Arg Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Lys Gln
     1025                1030                1035                1040
     Ser Gln Glu Tyr Glu Lys Leu Glu Glu Lys Cys Gly Met Cys Thr Gly
                 1045                1050                1055
     Lys Gly Gln Gly Asp Gly Lys Asp Cys Thr Gln Lys Asp Lys Glu Cys
```

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        Ser Pro Cys Lys Lys Ala Cys Asp Ala Tyr Lys Lys Glu Ile Glu Lys
                 1075                    1080                    1085
        Trp Glu Lys Gln Trp Lys Thr Val Ser Ala Ile Tyr Gln Ile Leu Tyr
   5         1090                    1095                    1100
        Ala Lys Ala Arg Ile Val Ala Ser Asn Gly Gly Pro Gly Tyr Tyr Asn
    1105                    1110                    1115                    1120
        Thr Glu Val Gln Lys Lys Asp Arg Ser Val Tyr Asp Phe Leu Tyr Glu
                        1125                    1130                    1135
  10    Leu His Leu Gln Asn Gly Gly Lys Lys Gly Pro Pro Pro Ala Thr His
                        1140                    1145                    1150
        Pro Tyr Lys Ser Val Asn Thr Arg Asp Lys Arg Asp Ala Thr Asp Asp
                 1155                    1160                    1165
        Thr Thr Pro Thr Val Tyr Ser Thr Ala Ala Gly Tyr Val His Gln Glu
  15         1170                    1175                    1180
        Ala His Ile Gly Asp Cys Lys Glu Gln His Val Phe Cys Asp Asn Asn
    1185                    1190                    1195                    1200
        Gly Asn Lys Glu Lys Tyr Ala Phe Lys Asn Pro Pro Asn Val Tyr Val
                        1205                    1210                    1215
  20    Glu Ala Cys Lys Cys Met Thr Arg Glu Ala Pro Pro Pro Thr Thr
                 1220                    1225                    1230
        Pro Ser Thr Pro Asn Pro Cys Ala Glu Thr Gly Gly Val His Thr Ile
                 1235                    1240                    1245
        Lys Thr Val Thr Asp Val Ala Lys Ile Leu Gln Gly Glu Ala Asn Glu
  25         1250                    1255                    1260
        Thr Met Leu Lys Asn Ser Ser Asn Gly Asn Asp Lys Asp Glu Ser Lys
    1265                    1270                    1275                    1280
        Leu Lys Gly Lys Ala Glu Glu Gly Asp Tyr Ser Arg Gly Gly Thr Pro
                        1285                    1290                    1295
  30    Ser Asp Phe Asn Asn Asn Leu Cys Gly Ile Thr Gln Lys His Ser Asn
                        1300                    1305                    1310
        Ala His Asn Asp Ser Gln Gln Pro Cys Tyr Gly Lys Asp Gln Lys Arg
                 1315                    1320                    1325
        Phe Asn Val Gly Thr Glu Trp Ser Phe Lys Asp Asn His Arg Lys Arg
  35         1330                    1335                    1340
        Thr His Pro Glu Ala Tyr Met Pro Pro Arg Arg Glu His Ile Cys Thr
    1345                    1350                    1355                    1360
        Ser Asn Leu Glu Tyr Leu Ile His Lys Arg Lys Lys Pro Ile Ile Glu
                        1365                    1370                    1375
  40    Gly Asp Pro Asn Lys Ile Ile His Ser Leu Leu Gly Asp Val Leu Leu
                        1380                    1385                    1390
        Ala Ala Lys Tyr Glu Ala Glu Asn Ile Lys Lys Leu Tyr Glu Glu Asn
                 1395                    1400                    1405
        Asn Asn Arg Lys Asp Gln Glu Gly Ile Cys Arg Ala Met Lys Tyr Ser
  45         1410                    1415                    1420
        Phe Ala Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Ile Glu
    1425                    1430                    1435                    1440
        Asn Asn Asp Ala Lys Arg Leu Gln Thr Asn Leu Lys Glu Ile Phe Thr
                        1445                    1450                    1455
  50    Lys Ile Lys Glu Lys Thr Gly Gly Thr Thr Tyr Asn Glu Asp Asn Asp
                 1460                    1465                    1470
        Pro Tyr Leu Lys Leu Arg Ala Asp Trp Trp Glu Ala Asn Arg Ala Lys
                 1475                    1480                    1485
        Val Trp Lys Ala Met Lys Cys Lys Thr Asn Gly Val Asp Ile Thr Cys
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        Asp Ser Asp His Thr Pro Leu Asp Asp Tyr Ile Pro Gln Arg Leu Arg
    1505                    1510                    1515                    1520
        Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Ala Gln Ser Gln Glu
                        1525                    1530                    1535
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    Gly Gly Asn Glu Cys Tyr Arg Glu Thr Lys Glu Cys Asn Asp Cys Lys
                 1555                    1560                    1565
  5 Gln Ala Cys Glu Glu Tyr Lys Arg Lys Ile Lys Thr Trp Ala Asp Gln
         1570                    1575                    1580
    Trp Lys Val Ile Ser Asn Lys Tyr Glu Asp Leu Tyr Lys Lys Ala Gln
    1585                    1590                    1595                    1600
    Asn Pro Thr Asn Ala Val Leu Lys Asp Asn Lys Asp Glu Lys Asp Lys
 10                  1605                    1610                    1615
    Asn Val Ile Asp Phe Leu Thr Gln Leu Gln Lys Ala Asn Asn Gly Glu
                 1620                    1625                    1630
    Lys Thr Gly Val His Thr Val Tyr Ser Thr Ala Ala Gly Tyr Ile His
                 1635                    1640                    1645
 15 Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp
         1650                    1655                    1660
    Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro
    1665                    1670                    1675                    1680
    His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu
 20                  1685                    1690                    1695
    Glu Pro Lys Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val
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    Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp
                 1715                    1720                    1725
 25 His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp
         1730                    1735                    1740
    Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met
    1745                    1750                    1755                    1760
    Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn
 30                  1765                    1770                    1775
    Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala
                 1780                    1785                    1790
    Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn
                 1795                    1800                    1805
 35 Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp
         1810                    1815                    1820
    Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys
    1825                    1830                    1835                    1840
    Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly
 40                  1845                    1850                    1855
    Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr
                 1860                    1865                    1870
    Asn Val Glu Gln Arg Lys Pro Trp Trp Gly Lys Asn Ala Glu Ala Ile
                 1875                    1880                    1885
 45 Trp Asp Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Thr Asn Lys Asn
         1890                    1895                    1900
    Met Asp Tyr Asn Ala His Thr Lys Leu Asn Pro Thr Tyr Gly Tyr Asn
    1905                    1910                    1915                    1920
    Ala Ile Lys Ser Glu Leu Glu Asp Phe Val Asn Arg Pro Gln Phe Leu
 50                  1925                    1930                    1935
    Arg Trp Phe Thr Glu Trp Ser Asp Glu Phe Cys Thr Glu Arg Ser Ile
                 1940                    1945                    1950
    Lys Ile Lys Glu Leu Glu Thr Lys Cys Asn Asp Cys Thr Val Ser Glu
                 1955                    1960                    1965
 55 Ser Gly Thr Ser Asp Ala Thr Gly Asn Lys Thr Cys Asp Asp Lys Asp
         1970                    1975                    1980
    Lys Cys Asp Glu Cys Lys Arg Ala Cys Thr Thr Tyr Lys Thr Trp Leu
    1985                    1990                    1995                    2000
    Lys Asn Trp Lys Thr Gln Tyr Lys Thr Gln Ser Lys Lys Tyr Phe Asp
```

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                       2005                    2010                    2015
       Asp Lys Arg Lys Glu Leu Tyr Lys Ser Ile Asp Asp Val Ala Ser Ser
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       Thr Gln Ala Tyr Gln Tyr Leu His Ala Gln Leu Lys Lys Leu Cys Gly
  5            2035                    2040                    2045
       Asn Ala Asp Cys Lys Cys Met Asp Gly Glu Ser Lys Glu Thr Thr Gly
           2050                    2055                    2060
       Gln Pro Asp Asn Ser His Asp Ser His Met Pro Ala Ser Leu Asp Asp
       2065                    2070                    2075                    2080
 10    Glu Pro Glu Glu Val Asn Gly Lys Cys Asn Cys Lys Val Lys His Arg
                   2085                    2090                    2095
       Pro Gln Pro Pro Leu Ala Leu Pro Pro Pro Ala Pro Ser Gly Pro Pro
               2100                    2105                    2110
       Ala Glu Asp Gln Ile Glu His Asp Asn Arg Gly Arg Ser Glu Arg Gly
 15            2115                    2120                    2125
       Asp Gln Gly Pro Leu Pro Ala Arg Pro Pro Pro Pro Pro Gln Ala Ala
           2130         .          2135                    2140
       Gln Pro Pro Gln Pro Lys Pro Lys Arg Thr Gly Glu Gly Leu Gly Arg
       2145                    2150                    2155                    2160
 20    Asn Leu Pro Pro Ala Asp Arg Asn Thr Asn Leu Ser Asp Ser Glu Glu
                   2165                    2170                    2175
       Glu Asp Asp Glu Asp Asp Asp Glu Val Gln Glu Glu Glu Thr Pro
           2180                    2185                    2190
       Pro Ser Glu Ala Glu Glu Gly Glu Gly His Val Glu Thr Glu Glu Glu
 25            2195                    2200                    2205
       Thr Lys Pro Val Lys Glu Lys Thr Glu Gly Ala Gly Ala Thr Glu Val
           2210                    2215                    2220
       Thr Lys Gln Gly Ser Ala Pro Thr Ala Thr Thr Pro Thr Val Glu Asp
       2225                    2230                    2235                    2240
 30    Ile Cys Ala Thr Val Ala Lys Ala Leu Lys Gly Asp Lys Ser Leu Asn
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       Ala Ala Cys Ala Leu Lys Tyr Gly Lys Asn Asn Ser Arg Leu Gly Trp
               2260                    2265                    2270
       Lys Cys Ile Pro Thr Ser Gly Asp Lys Thr Asp Thr Ser Glu Asn Gly
 35            2275                    2280                    2285
       Ala Pro Arg Arg Ala Arg Ser Ala His Gly Gly Lys Ser Asp Ser Glu
           2290                    2295                    2300
       Lys Gly Ser Ile Cys Val Pro Pro Arg Arg Arg Arg Leu Tyr Ile Lys
       2305                    2310                    2315                    2320
 40    Lys Ile Val Asp Trp Ala Glu Ser Gln Ser Lys Thr Val Thr Ser Val
                   2325                    2330                    2335
       Asn Gly Asp Gly Asn Gly Ser Gln Glu Val Val Ser Val Asn Gly Ala
               2340                    2345                    2350
       Ser Glu Ser Gly Gly Ser Gly Ser Gly Thr Glu Ser Gln Ala Ser Asp
 45            2355                    2360                    2365
       Val Ser Gln Gly Asn Gly Ala Ser Thr Ser Pro Gln Val Ala Leu Leu
           2370                    2375                    2380
       His Ala Phe Val Lys Ser Ala Ala Ile Glu Thr Phe Phe Ala Trp His
       2385                    2390                    2395                    2400
 50    Lys Tyr Lys Val Asp Lys Glu Ile Glu Glu Lys Glu Lys Gln Ala Ala
                   2405                    2410                    2415
       Gln Asn His Leu Val Gln Arg Lys Thr Ser Glu Asn Pro Gln Lys Lys
               2420                    2425                    2430
       Leu Glu Gly Gly Glu Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr
 55            2435                    2440                    2445
       Thr Leu Gly Asp Tyr Arg Asp Ile Leu Val Gly Asp Lys Thr Met Ile
           2450                    2455                    2460
       Glu Ala Leu Glu Lys Ser Gly Asp Thr Lys Ile Glu Asp Ile Ser Glu
       2465                    2470                    2475                    2480
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     Lys Ile Pro Lys Ile Leu Asp Gly Glu Asn Asn Lys Ala Ala Gly Gly
                     2485                2490                2495
     Gly Pro Lys Gln Pro Asn Ser Gly Lys Thr Pro Gln Glu Trp Trp Lys
                     2500                2505                2510
  5  Glu Asn Ala Lys His Ile Trp His Gly Met Ile Cys Ala Leu Thr Tyr
                     2515                2520                2525
     Asn Thr Asp Ser Asn Gly Lys Asp Lys Lys Ile Gln Gln Val Lys Ala
                 2530                2535                2540
     Thr Asp Asn Thr Asp Leu Phe Gln Lys Leu Lys Lys Asp Asn Asp Tyr
 10  2545                2550                2555                2560
     Glu Thr Val Ser Phe Gly Ala Ser Gly Thr Gly Ala Lys Ser Asn Asp
                     2565                2570                2575
     Asp Thr Lys Leu Lys Asn Phe Val Val Arg Pro Thr Tyr Phe Arg Trp
                 2580                2585                2590
 15  Leu Glu Glu Trp Gly Glu Glu Phe Cys Arg Lys Gln Lys His Lys Leu
                     2595                2600                2605
     Tyr Ile Ile Lys Lys Asp Cys Arg Asp Asn Lys Phe Cys Ser Gly Asp
                 2610                2615                2620
     Gly Leu Arg Cys Asp Glu Lys Val Pro Asp Lys Lys Asp Ile Phe Lys
 20  2625                2630                2635                2640
     His Phe Asp Cys Pro Ser Cys Ala Arg His Cys Arg Ser Tyr Arg Lys
                     2645                2650                2655
     Trp Ile Glu Arg Lys Lys Thr Glu Tyr Glu Lys Gln Glu Ser Ala Tyr
                 2660                2665                2670
 25  Ser Lys Gln Lys Ser Asn Tyr Val Asn Gly Ser Asn Gly Asp Gly Gly
                 2675                2680                2685
     Asn Asn Asn Asp Lys Glu Phe Tyr Thr Lys Leu Glu Thr Cys Thr Lys
                 2690                2695                2700
     Ala Thr Asn Phe Leu Glu Ser Leu Lys Gly Gln Cys Ile Gly Asn Asn
 30  2705                2710                2715                2720
     Asn Gly Gly Thr Asp Ile Lys Phe Ser Asn Thr Asn Ile Thr Phe Gly
                     2725                2730                2735
     Ser Ala Glu Asp Cys Lys Pro Cys Ser Glu Phe Lys Val Asn Cys Glu
                 2740                2745                2750
 35  Asn Gly Ser Cys Gly Ser Ala Lys Gln Lys Asp Cys Pro Asn Asn Thr
                 2755                2760                2765
     Ile Thr Ser Gln Asn Ile Lys Gly Leu Thr Asp Gln Val Asp Met Arg
                 2770                2775                2780
     Val Ser Asp Asn Thr Glu Ser Gly Phe Glu Gly Asp Leu Gly Ile Cys
 40  2785                2790                2795                2800
     Gln Gly Ala Gly Ile Phe Lys Gly Ile Arg Lys Asp Glu Trp Lys Cys
                     2805                2810                2815
     Gly Asp Phe Cys Gly Ile Asp Ile Cys Thr Leu Glu Lys Thr Asn Asn
                 2820                2825                2830
 45  Gly Lys Glu Ser Asp Lys Lys Tyr Ile Ile Met Lys Glu Phe Val Lys
                 2835                2840                2845
     Arg Trp Leu Glu Tyr Phe Phe Glu Asp Tyr Asn Arg Ile Gln Lys Lys
                 2850                2855                2860
     Leu Lys Thr Cys Lys Glu Asn Gly Lys Gly Ser Thr Cys Ile Arg Ser
 50  2865                2870                2875                2880
     Cys Val Asp Glu Trp Ile Lys Leu Lys Lys Asp Glu Trp Gln Lys Ile
                     2885                2890                2895
     Asn Ser Asn Tyr Leu Asp Gln Asn Thr Lys Glu Asn Pro Glu Gly Asn
                 2900                2905                2910
 55  Asn Leu Ser Ser Phe Leu Glu Asp Gly Pro Phe Lys Asn Glu Val Asp
                 2915                2920                2925
     Lys Ala Ile Lys Pro Cys Gly Asn Leu Thr Asp Phe Lys Lys Ser Lys
                 2930                2935                2940
     Lys Cys Asn Gly Thr Ser Arg Ser Gly Asn Ser Glu Glu Ser Thr Lys
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       Tyr Asp Gly Val Ile Cys Leu Leu Asp Asn Leu Lys Asn Ile Ile Lys
                        2965                    2970                    2975
       Thr Cys Gln Asn Val Pro Ser Gly Lys Pro Asp Thr Pro Cys Gln Lys
  5                 2980                    2985                    2990
       Ser Pro Ala Pro Val Gly Asp Asp Asp Pro Leu Glu Glu Glu Asn
                2995                    3000                    3005
       Pro Val Thr Gln Pro Asn Ile Cys Pro Gln Thr Ser Val Glu Glu Lys
            3010                    3015                    3020
 10    Lys Lys Glu Glu Glu Glu Lys Cys Asp Glu Lys Glu Glu Glu Glu Glu
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       Lys Glu Glu Glu Lys Asp Lys Gly Asp Glu Glu Val Lys Glu Glu Glu
                        3045                    3050                    3055
       Lys Asp Lys Gly Asp Glu Glu Glu Glu Ala Glu Glu Glu Glu Glu Glu
 15                 3060                    3065                    3070
       Glu Glu Glu Thr Asp Ser His Ile Tyr Glu Asp Tyr Ser Asp Ser Asp
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       Ala Glu Glu Asp Asp Glu Asp Glu Ala Val Thr Glu Ser Leu Ser Pro
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 20    Ser Glu Ser Gln Pro Lys Arg Leu Leu Arg Glu Phe Pro Ser Pro Glu
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       Leu Lys Asn Ala Met Leu Phe Ser Thr Ile Leu Trp Met Val Gly Ile
                        3125                    3130                    3135
       Gly Phe Ala Ala Phe Thr Tyr Phe Phe Leu Lys Lys Lys Pro Lys Ser
 25                 3140                    3145                    3150
       Pro Val Asp Leu Leu Arg Val Leu Asp Ile His Lys Gly Asp Tyr Gly
                3155                    3160                    3165
       Thr Pro Thr Pro Lys Ser Lys Asn Arg Tyr Ile Pro Tyr Val Ser Asp
                3170                    3175                    3180
 30    Thr Tyr Lys Gly Lys Thr Tyr Leu Tyr Val Glu Gly Asp Thr Asp Glu
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       Glu Lys Tyr Met Phe Leu Ser Asp Thr Thr Asp Ile Thr Ser Ser Glu
                        3205                    3210                    3215
       Ser Glu Tyr Glu Glu Leu Asp Ile Asn Asp Ile Tyr Val Pro Gly Ser
 35                 3220                    3225                    3230
       Pro Lys Tyr Lys Thr Leu Ile Glu Val Val Leu Glu Pro Ser Lys Ser
                3235                    3240                    3245
       Asp Gly Asn Thr Pro Gly Lys Gly Asp Gly Asn Thr Leu Gly Asp Asp
                3250                    3255                    3260
 40    Met Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Asn Glu Leu
       3265                    3270                    3275                    3280
       Lys Gln Asp Phe Val Ser Gln Tyr Ile Gln Ser Arg Leu Pro Met Asp
                        3285                    3290                    3295
       Val Pro Gln Tyr Asp Val Ser Thr Glu Ser Pro Met Asn Ile Gly Gly
 45                 3300                    3305                    3310
       Asn Val Leu Asp Asp Gly Met Asp Glu Lys Pro Phe Ile Thr Ser Ile
                3315                    3320                    3325
       His Asp Arg Asp Leu Asn Ser Gly Glu Glu Ile Ser Tyr Asn Ile His
                3330                    3335                    3340
 50    Met Ser Thr Asn Thr Asn Asn Asp Ile Pro Lys Tyr Val Ser Asn Asn
       3345                    3350                    3355                    3360
       Val Tyr Ser Gly Ile Asp Leu Ile Asn Asp Thr Leu Ser Asp Asn Lys
                        3365                    3370                    3375
       His Ile Asp Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu
 55                 3380                    3385                    3390
       Phe Gly Thr Asn Tyr Lys Lys Asn Thr Ser Asn Asn Ser Val Ala Lys
                3395                    3400                    3405
       Asn Thr Asn Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Lys
                3410                    3415                    3420
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      3425                3430                3435                3440
      Asp Ile Leu Asn Lys Leu Asn Glu Gln Trp Asn Lys Asp Asn Asp Gly
                      3445                3450                3455
  5   Gly Asp Ile Pro Asn Asp Asn Lys Lys Leu Asn Thr Asp Val Ser Ile
                  3460                3465                3470
      Gln Ile Asp Met Asp Glu Thr Lys Gly Lys Lys Glu Phe Ser Asn Met
              3475                3480                3485
      Asp Thr Ile Leu Asp Asp Met Glu Asp Asp Ile Tyr Tyr Asp Val Asn
 10       3490                3495                3500
      Asp Glu Asn Pro Ser Val Asp Asp Ile Pro Met Asp His Asn Lys Val
      3505                3510                3515                3520
      Asp Val Pro Lys Lys Val His Val Glu Met Lys Ile Leu Asn Asn Thr
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gtttggaggg acaaagcata tgaaagagat ccttgttatg cagacaagc  aaaaaataat 300
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<212> PRT
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<400> 4
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Lys Arg Asp Val Ser Asn Asn Ala Lys Arg His Gly Lys Val Leu Lys
        35                  40                  45
Gly Asn Leu Arg Asp Ala Lys Phe Tyr His Asp Tyr Ser Lys Leu Arg
    50                  55                  60
Asp Ile Pro Arg Ser Pro Cys Asp Leu Asp Phe Trp Phe His Thr Asn
65                  70                  75                  80
Val Trp Arg Asp Lys Ala Tyr Glu Arg Asp Pro Cys Tyr Gly Arg Gln
                85                  90                  95
Ala Lys Asn Asn Tyr Asn Leu Glu Gly Ala Val Cys Thr Asn Ser Lys
            100                 105                 110
Ile Lys Gly Asn Glu Asn Lys Ile Asn Asp Ile Gly Ala Cys Ala Pro
            115                 120                 125
Tyr Arg Arg Arg Asn Ile Cys Asp Tyr Asn Leu Glu His Leu Asn Glu
        130                 135                 140
Arg Asn Val Leu Asn Thr His Asp Leu Leu Gly Asn Val Leu Val Met
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Ala Lys Arg Glu Gly Glu Ser Ile Val Glu Lys His Pro Asn Arg Gly
                165                 170                 175
Ser Ser Glu Val Cys Ile Ala Leu Ala Arg Ser Phe Ala Asp Ile Gly
            180                 185                 190
Asp Ile Leu Arg Gly Lys Asp Met Tyr Val Gly Tyr Asp Glu Lys Glu
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Lys Asn Arg Arg Lys Gln Leu Glu Asn Lys Leu Lys Asp Ile Phe Asp
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Asn Ile Tyr Lys Asp Leu Thr Lys Lys Lys Gly Arg Asn Gly Lys Lys
225                 230                 235                 240
Ser Ala Leu Gln Glu Arg Tyr Asn Asp Pro Lys Gly Asp Phe Phe Gln
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Leu Arg Glu Asp Trp Trp Ala Leu Asn Arg Glu Asp Val Trp Lys Ala
            260                 265                 270 .
Leu Thr Cys Ser Ala Asp Asp Ser Glu Asp Tyr Phe Ile Gln Ser Glu
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Gly Val Thr Lys Ser Phe Thr Asn Pro Lys Cys Gly His Gly Asp Asn
        290                 295                 300
Glu Val Leu Thr Asn Leu Asp Tyr Val Pro Gln Phe Leu Arg Trp Phe
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Thr Glu Trp Ala Glu Glu Phe Cys Arg Ile Arg Lys Ile Lys Leu Gly
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Lys Val Lys Asn Glu Cys Arg Gly Glu Thr Ser Gly Lys Arg Tyr Cys
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Ser Gly Asp Gly Tyr Asp Cys Thr Lys Thr Asp Ile Ser Arg Asn Ile
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     Asn Thr Ile Glu Asp Lys Ile Asp Phe Asn Lys Ala Asn Gln Thr Phe
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     Thr Ser Ser Lys Phe Cys Gly Ala Cys Pro Phe Tyr Gly Val Lys Cys
     465                 470                 475                 480
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     Val Leu Val Thr His Ile Arg Gly Thr Asn Ile Pro Glu Asp Leu Lys
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     Asp Cys Lys Lys Tyr Gly Leu Phe Lys Gly Met Arg Lys Gln Ala Trp
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     Lys Cys Gln Tyr Ile Asn Pro Tyr Asp Glu Cys Lys Leu Ser Pro Phe
     545                 550                 555                 560
25   Val Lys Asp Ile Asp Val Asp Asp Arg Ile Leu Phe Lys Val Leu Phe
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     Glu Arg Trp Leu Lys Tyr Phe Ile Gln Asp Phe Asn Asn Val Lys Asp
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     Lys Ile Asn Arg Cys Thr Lys Phe Glu Lys Gly Lys Asp Asn Thr Cys
30               595                 600                 605
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     625                 630                 635                 640
35   Lys Lys His Tyr Thr Tyr Ser Val Pro Arg Trp Val Asn Ser Tyr Leu
                     645                 650                 655
     Thr His Gln His Phe Ser Ser Asp Phe Ile Asn Ala Leu Glu Ala Phe
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     Lys Asn Ile Arg Gly Leu Glu Asn Leu Lys Glu Cys Ser Ser Asp Thr
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     Cys Lys Ile Glu Lys Ile Arg Thr Ile Asp Asp Asp Leu Ile Lys Glu
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     Leu Ile Ser Lys Leu Lys Asp Lys Cys Ala Met Cys Lys Asn Gln His
     705                 710                 715                 720
45   Lys Ala Thr Lys Gly Lys Glu Cys Cys Gly Lys Leu Pro Lys Thr Leu
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     Asn Asp Gln Asp Asp Glu Glu Asp Glu Glu Tyr Glu Ala Pro Pro Pro
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     Pro Thr Pro Pro Arg Thr Gln Lys Asn Pro Cys Val Asn Gly Gln Asn
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     Gln Lys Val Arg Lys Ile Arg Ser Val Arg Arg Val Pro Lys Arg Met
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     Gln Lys Gln Ala Ser Val Arg Val Pro Arg Ala Arg Gln Gly Gly Glu
     785                 790                 795                 800
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     Val Leu Leu Val Gly Glu Ala Glu Ala Glu Glu Pro Glu Thr Ala Glu
                 820                 825                 830
     Glu Lys Lys Glu Glu Glu Lys Glu Glu Asp Thr Asp Gly Lys Val Gln
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  5  865                        870                    875                    880
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 10  Cys Val Ile Asn Leu Glu His Phe Lys Glu Asn Thr Ser Asp Asp Leu
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 15  945                        950                    955                    960
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     Pro Pro Thr Glu Arg Thr Asn Asp Thr Ile Arg Lys Glu Phe Trp Glu
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     Lys Asn Ala Glu Ser Ile Trp Gln Gly Met Leu Cys Ala Leu Ser Tyr
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     Ser Thr Tyr Asn Tyr Asp Thr Ile Lys Asn Asn Leu Glu Asp Phe Ala
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 30  Asn Arg Pro Gln Phe Leu Arg Trp Phe Ile Glu Trp Ser Asp Glu Phe
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     Asn Asp Tyr Glu Gly Cys Ala Asn Thr Lys Asp Asn Gly Asn Gly Asn
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     Cys Val Asn Ala Cys Asn Ala Tyr Lys Lys Tyr Ile Thr Asp Lys Lys
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     Glu Gln Tyr Glu Lys Gln Ala Lys Lys Phe Asp Ile Asp Lys Ser Gln
                 1140                       1145                   1150
 40  Asn Lys Pro Gly Tyr Glu Asp Tyr Ser Gly Lys Lys Ala Ser Glu Tyr
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     Lys Asp Asn Ser Asn Tyr Trp Glu Lys Pro His Thr Thr Tyr Asp Asp
 45  1185                       1190                   1195                   1200
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     Pro Arg Arg Lys Arg Leu Tyr Val Lys Asp Leu Glu Thr Phe Ser Asp
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     His Thr Thr Val Gly Leu Arg Glu Ala Phe Ile Lys Cys Ala Ala Val
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     Glu Thr Phe Phe Ala Trp His Glu Phe Thr Lys Glu Lys Glu Arg Glu
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 5  Lys Asn Gly Glu Ile His Glu Glu Phe Lys Ser Gln Met Phe Tyr Thr
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    Ser Ser Gly Lys Thr Pro Thr Ala Lys Lys Thr Thr Pro Lys Glu Trp
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    Trp Glu Lys Asn Ala Lys Asp Ile Trp Glu Gly Met Leu Cys Ala Leu
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15  Ser Tyr Asp Thr Lys Thr Lys Ile Lys Asn Glu Glu Leu Arg Lys Lys
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    Lys Ile Lys Ile Asp Lys Ile Glu Lys Glu Cys Arg Gly Pro Tyr Gly
            1490                1495                1500
25  Arg Asn His Cys Asp Gly Asp Gly Phe Asp Cys Ser Glu Ile Gly Pro
    1505                1510                1515                1520
    Asn Glu Asn Gly Ser Phe Ala Ile Phe Lys Cys Pro Ser Cys Ala Ile
            1525                1530                1535
    Ser Cys Arg Ser Tyr Lys Thr Trp Ile Asn Thr Lys Lys Asp Glu Phe
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    Lys Lys Gln Glu Lys Leu Tyr Asn Lys Glu Ile Lys Asp Asn Lys Ser
            1555                1560                1565
    Asn Tyr Asp Asn Ile Tyr Asp Lys Glu Phe Val Lys Asn Leu Cys Thr
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            1635                1640                1645
    Cys Asp Ala Gln Glu Phe Lys Val Thr Tyr Asp Val Lys Asn Lys Glu
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55  Lys Asp His Asn Lys Ile Lys Asp Lys Ile Ser Leu Cys Ile Asn Asn
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 10     Val Val Glu Ser Leu Leu Asn Lys Leu Lys Asn Glu Ile Arg His Cys
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 15         1890                  1895                  1900
        Pro Asp Ile Pro Pro Gly Asp Val Ala Pro Thr Phe Cys Asn Val Pro
        1905                  1910                  1915                  1920
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                    1925                  1930                  1935
 20     Glu Val Ala Lys Glu Met His Glu Glu Ala His Lys Asp Met Leu Glu
                1940                  1945                  1950
        Arg Ser Val Lys Lys Val Glu Ser Lys Val Lys Asp Ser Thr Val Glu
                1955                  1960                  1965
        Ser Val Leu Arg Ala Asp Ala Ser Lys Gly Glu Tyr Lys His Glu Gly
 25         1970                  1975                  1980
        Asn Pro Asp Asp Leu Lys His Asn Met Cys Asn Ile Thr Lys Glu His
        1985                  1990                  1995                  2000
        Thr Asn Tyr Gln Lys Arg Gly Gly Tyr Asn Tyr Arg Gly Pro Cys Thr
                    2005                  2010                  2015
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        2065                  2070                  2075                  2080
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        Leu Val Thr Ile Phe Gly Lys Ile Lys Glu Glu Ile Pro Asp Ile Lys
        2145                  2150                  2155                  2160
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    Asn His Pro Asp Lys Asn Ser Asn Gly Asn Lys Ser Gly Ile Cys Thr
                180                   185                   190
    Ser Leu Ala Arg Ser Phe Ala Asp Ile Gly Asp Ile Val Arg Gly Arg
15          195                   200                   205
    Asp Met Phe Lys Ser Asn Glu Lys Val Glu Ile Gly Leu Lys Lys Val
        210                   215                   220
    Phe Glu Lys Ile Asn Asn Gly Leu Lys Lys Ile Gly Ile Asn Asp Tyr
    225                   230                   235                   240
20  Asn Asp Ile Ser Gly Asn Tyr Tyr Lys Leu Arg Glu Ala Trp Trp Thr
                245                   250                   255
    Ala Asn Arg Asp Gln Val Trp Lys Ala Ile Thr Cys Arg Ala Pro Asn
                260                   265                   270
    Gly Ala Asn Tyr Phe Arg Lys Gly Leu Asp Gly Lys Ile Ile Phe Ser
25          275                   280                   285 .
    Asp Asn Gly Pro Cys Gly Arg Lys Glu Leu Ile Val Pro Thr Tyr Leu
            290                   295                   300
    Asp Tyr Val Pro Gln Phe Leu Arg Trp Leu Asn Glu Trp Ser Glu Glu
    305                   310                   315                   320
30  Phe Cys Arg Ile Lys Asn Ile Lys Ile Gly Asn Ile Lys Lys Ser Cys
                325                   330                   335
    Thr Gly Glu Ser Asn Asn Lys His Cys Ser Arg Glu Gly Tyr Asp Cys
                340                   345                   350
    Asn Lys Thr Asn Leu Arg Leu Asn Glu Ile Phe Met Asp Leu Glu Cys
35          355                   360                   365
    Pro Arg Cys Ala Asp Asp Cys Lys Ser Tyr Glu Thr Trp Val Glu Lys
            370                   375                   380
    Lys Lys Lys Glu Phe Asn Lys Gln Lys Lys Lys Tyr Glu Lys Glu Val
    385                   390                   395                   400
40  Asp Ala Thr Gln Asn Asn Asp Asn Asn Glu Asn Gly Ile Tyr Asn Lys
                405                   410                   415
    Lys Phe Tyr Asp Glu Leu Lys Ser Ser Tyr Lys Glu Val Asn Ser Phe
                420                   425                   430
    Phe Glu Leu Leu Asn Lys Gly Pro Ile Cys Glu His Ile Asp Lys Lys
45          435                   440                   445
    Ile Pro Met Asp Tyr Asn Asn Thr Glu Lys Thr Phe Ser Arg Ser Glu
            450                   455                   460
    Tyr Cys Lys Ser Cys Pro Ile Thr Asp Ile Leu Cys Asp Asp Asn Glu
    465                   470                   475                   480
50  Cys Lys Thr Ile Asn Glu Phe Lys Cys Arg Glu Ile Lys Ser Met Pro
                485                   490                   495
    Asn Ile Arg Lys Asn Glu Asn Glu Thr Pro Ile Asp Ile Asp Ile Leu
                500                   505                   510
    Val Asn Val Asn Asn Lys Lys Val Ile Thr His Asp Leu Lys Asn Asn
55          515                   520                   525
    Tyr Glu Asn Cys Asp Leu Phe Lys Lys Leu Gly Glu Gln Lys Trp Lys
            530                   535                   540
    Cys Lys Tyr Lys Cys Tyr Leu Asp Val Cys Glu Pro Arg Asn Leu Asp
    545                   550                   555                   560
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      Ser Asn Ile Tyr Asn Glu Arg Tyr Ile Ser Ile Lys Val Leu Phe Lys
                  565                     570                     575
      Arg Trp Leu Glu Tyr Phe Leu Glu Asp Tyr Asn Lys Leu Lys Glu Lys
                  580                     585                     590
  5   Leu Asn Pro Cys Met Tyr Asn Val Gln Glu Ile Val Cys Ile Asn Glu
                  595                     600                     605
      Cys Lys Gln Asn Cys Glu Cys Val Glu Lys Trp Ile Lys Glu Lys Arg
                  610                     615                     620
      Glu Glu Trp Lys Lys Ile Lys Asp Arg Tyr Val Gln Gln Tyr Glu Ser
 10   625                     630                     635                     640
      Lys Asp Glu Asp Val Ser Ser Lys Leu Lys Lys Phe Leu Lys Gln Glu
                  645                     650                     655
      Leu Phe Thr Asn Tyr Val Lys Asn Ala Leu Asp Lys Asp Glu Thr Leu
                  660                     665                     670
 15   Asp Ser Met Lys Glu Ser Thr Glu Cys Ile Asp Pro Asn Lys Pro Lys
                  675                     680                     685
      Gly Lys Pro Cys Asn Asn Asn Asp Val Ile Asn Ile Leu Leu Asn Arg
                  690                     695                     700
      Leu Glu Lys Gln Ile Asp Asn Cys Lys Lys Lys His Glu Glu Lys Gly
 20   705                     710                     715                     720
      Glu Lys Pro Cys Val Asp Ile Pro Lys Leu Leu Asn Asp Glu Asp Glu
                  725                     730                     735
      Asp Glu Asp Asp Asp Glu Thr Pro Arg Ala His Asn Pro Cys Val Asp
                  740                     745                     750
 25   Lys Asn Asp Ser Gln Pro Thr Lys Thr Val Ser Tyr Ile Ala Arg Gln
                  755                     760                     765
      Met His Arg Arg Ala Lys Ala Gln Met Thr Lys Asn Ser Val Val Asp
                  770                     775                     780
      Gly Asp Asn Lys Leu Glu Gly Asp Ile Phe Lys Val Thr Phe Arg Asn
 30   785                     790                     795                     800
      Gly Gly Val Gly Lys Asn Leu Asn Gly Asp Ile Cys Lys Ile Asp Lys
                  805                     810                     815
      Thr Tyr Ser Asn Asp Ser Arg Gly Thr Pro Thr Asp Gly Pro Cys Glu
                  820                     825                     830
 35   Gly Lys Gly Asp Arg Phe Lys Ile Gly Thr Asp Trp Gln Gly Asp Ser
                  835                     840                     845
      Phe Val Asn Pro Gln Tyr Arg Gly Ile Tyr Met Pro Pro Arg Arg Gln
                  850                     855                     860
      His Phe Cys Thr Ser Asn Leu Glu Lys Leu Asp Val Ser Arg Val Ile
 40   865                     870                     875                     880
      Arg Asn Gly Asn Ala Ser Asn Ser Leu Leu Gly Asp Val Leu Leu Ala
                  885                     890                     895
      Ala Lys Tyr Glu Ala Glu Arg Thr Lys Asn His Tyr Val Ser Lys Lys
                  900                     905                     910
 45   Glu Glu His Ser Glu Ala Cys Arg Ala Val Arg Tyr Ser Phe Ala Asp
                  915                     920                     925
      Leu Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Asp Lys Asn His Gly
                  930                     935                     940
      Glu Lys Lys Thr Gln Glu Asn Leu Glu Arg Ile Phe Ala Lys Ile Lys
 50   945                     950                     955                     960
      Glu Gln Leu Leu Asn Ser Ser Ile Lys Asp Lys Tyr Lys Asp Asp Asp
                  965                     970                     975
      Lys Ala Thr Pro Lys Tyr Lys Gln Leu Arg Glu Asp Trp Trp Glu Ala
                  980                     985                     990
 55   Asn Arg Ser Gln Val Trp Glu Ala Met Gln Cys Pro Pro Lys Asn Gly
                  995                     1000                    1005
      Thr Phe Pro Cys Lys Ser Asp His Thr Pro Leu His Asp Tyr Ile Pro
                  1010                    1015                    1020
      Gln Arg Leu Arg Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Glu
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               1025                  1030                  1035                  1040
          Gln Ser Arg Leu Tyr Gly Glu Leu Val Glu Thr Cys Gly Lys Cys Met
                         1045                  1050                  1055
          His Lys Gly Lys Cys Lys Gln Gly Asn Gly His Cys Val Thr Cys Lys
     5
          Pro Ala Cys Glu Lys Tyr Lys Lys Phe Ile Asn Thr Trp Gln Pro Gln
                    1075                  1080                  1085
          Trp Lys Gln Met Glu Gln Lys Tyr Ser Gln Leu Tyr Glu Glu Ala Lys
               1090                  1095                  1100
    10    Lys Tyr Asn Asp Ser Ser Arg Lys Asp Thr Thr Asn Lys Asp Asp Tyr
          1105                  1110                  1115                  1120
          Val Leu Gln Phe Leu Asn Lys Leu Leu Thr Gln Asn Lys Gly Asn Lys
                    1125                  1130                  1135
          Thr Tyr Asp Thr Ala Glu Gly Tyr Val His Gln Glu Ala His Ile Ser
    15             1140                  1145                  1150
          Asp Cys Gln Lys Gln Thr Gln Phe Cys Lys Lys Arg Asn Gly Glu Ile
                    1155                  1160                  1165
          Pro Ser Ser Asp Thr Glu Thr Asp Asn Asn Tyr Ala Phe Arg Pro Gln
               1170                  1175                  1180
    20    Pro His Asp His Asp Glu Val Cys Glu Cys Asn Thr Arg Gln Lys Thr
          1185                  1190                  1195                  1200
          Lys Val Arg Lys Lys Lys Lys Lys Val Asp Ala Cys Glu Met Ala Lys
                    1205                  1210                  1215
          Thr Leu Leu His Asn Asn Asp Gly Thr Ile Arg Ile Gly Gln Cys Lys
    25             1220                  1225                  1230
          Arg Lys Asp Glu Gly Asn Ala Glu Tyr Pro Lys Trp Asp Cys Asn Ser
               1235                  1240                  1245
          Gln Ile His Thr Thr His Asn Gly Ala Cys Met Pro Pro Arg Arg Gln
               1250                  1255                  1260
    30    Lys Leu Cys Val Tyr Phe Phe Ala Asn Pro Ser Gln Ile Gly Ser Ile
          1265                  1270                  1275                  1280
          Asn Lys Gln Asp Asn Leu Arg Lys Ala Phe Ile Ile Ser Ala Ala Ala
                    1285                  1290                  1295
          Glu Thr Phe Arg Ser Trp Gln Tyr Tyr Lys Ser Lys Asn Gly Gly Glu
    35             1300                  1305                  1310
          Asn Leu Gln Thr Gln Leu Lys Asp Gly Thr Ile Pro Asp Asp Phe Lys
               1315                  1320                  1325
          Arg Gln Met Phe Tyr Thr Tyr Gly Asp Tyr Arg Asp Phe Leu Phe Gly
               1330                  1335                  1340
    40    Thr Asp Ile Ser Lys Gly Leu Gly Glu Gly Thr Ala Leu Glu Lys Gln
          1345                  1350                  1355                  1360
          Ile Asn Ile Leu Phe Pro Asn Gly Val Arg Lys Ile Pro Asn Glu Lys
                    1365                  1370                  1375
          Thr Arg Glu Lys Trp Trp Thr Asp His Gly Pro Glu Ile Trp Lys Gly
    45             1380                  1385                  1390
          Met Leu Cys Ala Leu Thr Asn Gly Leu Ser Glu Ser Glu Lys Lys Thr
                    1395                  1400                  1405
          Lys Ile Phe Asp Asp Tyr Ser His Asp Lys Val Asn Gln Ser Lys Asn
               1410                  1415                  1420
    50    Gly Asn Pro Ser Leu Glu Asp Phe Ala Lys Lys Pro Gln Phe Phe Arg
          1425                  1430                  1435                  1440
          Trp Phe Ile Glu Trp Ser Asp Glu Phe Cys Arg Glu Arg Lys Lys Lys
                    1445                  1450                  1455
          Glu Glu Glu Val Glu Arg Asp Cys Lys Asp Glu Tyr Glu Gly Cys Glu
    55             1460                  1465                  1470
          Lys Glu Lys Asn Gly Lys Cys Val Thr Ala Cys Lys Ala Tyr Lys Glu
                    1475                  1480                  1485
          Tyr Ile Thr Asn Lys Lys Glu Glu Tyr Asp Ser Gln Lys Gly Lys Phe
               1490                  1495                  1500
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     Asp Val Glu Lys Thr Glu Lys Lys Gln Gly Tyr Glu Asp Tyr Ser Glu
     1505                1510                1515                1520
     Lys Gln Ala Ser Glu Tyr Leu Lys Glu Lys Cys Ile Lys Ser Ser Cys
                    1525                1530                1535
  5  Asn Cys Met Lys Lys Val Thr Glu Ile Ser Asn Tyr Trp Thr Asn Pro
                    1540                1545                1550
     His Lys Thr Tyr Asp Thr Glu Asn Leu Gly Ile Lys Cys Glu Cys Pro
                1555                1560                1565
     Pro Ser Pro Cys Thr Ile Val Asp Gly Ile Leu Ser Pro Gln Asn Ser
 10      1570                1575                1580
     Ser Ser Tyr Ala Glu Gly Cys Lys Trp Lys Tyr Gly Lys Met Ser Gln
     1585                1590                1595                1600
     Gly Gly Thr Glu Trp Asp Cys Ser Lys Lys Ser Gly Gly Glu Gly Gly
                    1605                1610                1615
 15  Asn Glu Asp Gly Asp Val Val Cys Ile Pro Pro Arg Arg Arg Arg Leu
                    1620                1625                1630
     Tyr Val Lys Asn Leu Gln Asp Leu Thr Gly Glu Glu Ser Leu Val Asp
                1635                1640                1645
     Leu Arg Lys Ala Phe Ile Lys Cys Ala Ala Ile Glu Thr Phe Phe Ala
 20      1650                1655                1660
     Trp His Glu Phe Lys Lys Glu Lys Glu Arg Glu Glu Lys Glu Lys Asn
     1665                1670                1675                1680
     Glu Gln Asp Val Gln Tyr Lys Ser Ser Val Leu Glu Asn Leu Gln Lys
                    1685                1690                1695
 25  Gln Leu Lys Asn Gly Glu Ile Asp Asp Glu Phe Lys Arg Gln Met Phe
                    1700                1705                1710
     Tyr Thr Phe Ala Asp Tyr Arg Asp Ile Cys Leu Gly Lys Asp Ile Gly
                1715                1720                1725
     Asn Asp Val Asp Gly Ile Asn Glu Lys Ile Asp Thr Ile Leu Gln Lys
 30      1730                1735                1740
     Asn Gly Lys Pro Asn Asn Ile Glu Glu Tyr Lys Lys Trp Trp Gln Lys
     1745                1750                1755                1760
     His Gly His Glu Ile Trp Glu Gly Met Leu Cys Ala Leu Ser Tyr Asn
                    1765                1770                1775
 35  Thr Glu Thr Lys Glu Met Asp Lys Glu Leu Arg Asn Lys Leu Thr Glu
                    1780                1785                1790
     Gln Lys Asn Gly Asn Lys Asn Thr Tyr Asp Thr Val Thr Ile Ser Gly
                1795                1800                1805
     Gly Pro Ile Gly Asn Thr Lys Leu Glu Lys Phe Ala Ser Arg Pro Pro
 40      1810                1815                1820
     Phe Phe Arg Trp Leu Glu Glu Trp Ala Asp Glu Phe Cys Arg Lys Arg
     1825                1830                1835                1840
     Thr His Lys Leu Glu Lys Ile Gln Asn Glu Cys Lys Gly Val Ser Gly
                    1845                1850                1855
 45  Thr Asn Gln Cys Asp Asp Asp Gly Phe Asp Cys Asp Glu Met Cys Pro
                    1860                1865                1870
     Lys Lys Asp Gly Ser Phe Glu Thr Phe Lys Cys Leu Ser Cys Ala Lys
                1875                1880                1885
     Ser Cys Arg Phe Tyr Lys Lys Trp Ile Ser Arg Lys Lys Glu Glu Phe
 50      1890                1895                1900
     Asp Lys Gln Ser Lys Lys Tyr Glu Asn Glu Ile Asp Asp Val Lys His
     1905                1910                1915                1920
     Asn Ser Asp Asn Ile Tyr Gly Lys Asp Phe Leu Glu Thr Leu Asp Gln
                    1925                1930                1935
 55  Gln Tyr Lys Ser Val Glu Leu Phe Leu Glu Lys Val Lys Gly Pro Cys
                1940                1945                1950
     Ser Ile Asn Asn Asn Asn Glu Glu Cys Lys Ile Asp Phe Asn Lys Pro
                1955                1960                1965
     Lys Asp Thr Phe Gly His Ala Lys Asn Cys Gly Pro Cys Ser Glu Ile
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             1970                    1975                      1980
     Arg Phe Lys Cys Ile Glu Asp Asn Ser Asn Trp Val Thr Thr Asn Thr
     1985                    1990                      1995                2000
  5  Cys Asn Lys Thr Thr Phe Lys Phe Thr Glu Asp Asn Lys Asp Thr Lys
                     2005                    2010                      2015
     Glu Asp Ser Glu Gln Leu Gly Met Leu Ile Ser Asp Asn Thr Val Gln
                 2020                    2025                      2030
     Asn Phe Ala Asp Gly Leu Gln Asn Asp Cys Lys Asp Ala Asp Ile Phe
                 2035                    2040                      2045
 10  Lys Gly Leu Arg Lys Asp Gln Trp Ser Cys Gly Tyr Phe Cys Asn Leu
                 2050                    2055                      2060
     Asp Ile Cys Ser Leu Lys Thr Ser His Gly Glu Asn Asn Tyr Lys Gln
     2065                    2070                      2075                2080
     Asn Ile Leu Ile Arg Ala Leu Phe Lys Arg Trp Leu Glu His Phe Leu
 15                  2085                    2090                      2095
     Glu Asp Tyr Asn Lys Ile Asn Asp Lys Ile Ser His Cys Met Lys Asn
                 2100                    2105                      2110
     Gly Glu Gly Ser Thr Cys Ile Lys Gly Cys Glu Ile Lys Cys Asn Cys
                 2115                    2120                      2125
 20  Val Ser Asn Trp Ile Lys Lys Lys Thr Leu Glu Trp Glu Ile Val Arg
                 2130                    2135                      2140
     Asp Arg Phe Phe Lys Gln Tyr Asn Val Asp Ser Glu Lys Ser Phe Thr
     2145                    2150                      2155                2160
     Val Lys Ser Phe Leu Glu Gln Ala Pro Phe Asp Ser Asp Val Gln Lys
 25                  2165                    2170                      2175
     Ala Ile Lys Pro Phe Glu Lys Leu Arg Asp Phe Glu Asp Ser Ile Val
                 2180                    2185                      2190
     Cys Asn Gly Thr Thr Ser Ala Arg Lys Glu Lys Gly Thr Glu Lys Asp
                 2195                    2200                      2205
 30  Val Val Ile Cys Leu Leu Asp Lys Leu Gln Lys Gln Ile Glu Thr Cys
                 2210                    2215                      2220
     Gln Thr Lys His Lys Glu Thr Ser Gly Asn Thr Cys Ser Pro Pro Pro
     2225                    2230                      2235                2240
     Asn Pro Asp Thr Gln Thr Asp Thr Pro Leu Pro Leu Glu Ser Phe Pro
 35                  2245                    2250                      2255
     Pro Pro Phe Cys Asn Val Pro Pro Asn Pro Cys Gly Asp Lys Asp Ala
                 2260                    2265                      2270
     Thr Asn Val Val Gly Val Glu Val Leu Ala Lys Glu Met Gln Glu Ala
                 2275                    2280                      2285
 40  Ala His Lys Ser Met Leu Ser Arg Ser Ala Val Asp Ser Gly Lys Gly
                 2290                    2295                      2300
     Asp Lys Gly Glu Ser Ser Ser Gly Lys Ser Ser Leu Glu Gly Asp Ile
     2305                    2310                      2315                2320
     Ser Leu Ala Glu Phe Lys Asn Gly Phe Asn Pro Ser Gly Leu Lys Asn
 45                  2325                    2330                      2335
     Val Cys Gln Ile Thr Glu Lys His Ser Tyr Ala Asn Gly Ala Ser Lys
                 2340                    2345                      2350
     Asp Pro Cys Asn Gly Lys Gly Asn Gly Lys Asp Gln Arg Phe Lys Ile
                 2355                    2360                      2365
 50  Glu Thr Gln Trp Lys Asp Thr Gly Lys Ser Gly Lys His Val Asp Val
                 2370                    2375                      2380
     Tyr Leu Pro Pro Arg Arg Glu His Ile Cys Thr Ser Asn Leu Glu Tyr
     2385                    2390                      2395                2400
     Leu Leu Lys Gly Asn Ser Asp Gln Ile Met Lys Val Gly Asn Asn Lys
 55                  2405                    2410                      2415
     Ile Asn His Ser Phe Leu Gly Glu Val Leu Leu Ala Ala Lys Tyr Glu
                 2420                    2425                      2430
     Ala Glu Phe Ile Lys Thr Asn Tyr Thr Arg Leu Asn Gly Gln Asn Asp
                 2435                    2440                      2445
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     Asn Gly Ala Lys Cys Arg Ala Met Lys Tyr Ser Phe Ala Asp Ile Gly
         2450                    2455                    2460
     Asp Ile Val Arg Gly Arg Asp Leu Trp Glu His Asn Asp Phe Lys Lys
     2465                    2470                    2475                    2480
  5  Leu Glu Arg Asp Leu Val Lys Ile Phe Gly Lys Ile Lys Glu Gly Ile
                 2485                    2490                    2495
     Thr Asp Glu Thr Thr Lys Lys Gln Tyr Glu Lys Asp Asp Thr Asp Asn
                 2500                    2505                    2510
     Lys Gln Leu Arg Cys Asp Trp Trp Glu Ala Asn Arg Asp Gln Val Trp
 10          2515                    2520                    2525
     Glu Ala Met Gln Cys Lys Thr Thr Ile Pro Pro Val Thr Thr Ser Cys
         2530                    2535                    2540
     Asp Thr Thr Thr Val Thr Pro Leu Val Asp Tyr Ile Pro Gln Arg Leu
     2545                    2550                    2555                    2560
 15  Arg Trp Met Met Glu Trp Ala Glu Trp Tyr Cys Lys Tyr Gln Ser Lys
                 2565                    2570                    2575
     Ala Tyr Ser Glu Leu Arg Lys Gly Cys Glu Asp Cys Arg Ser Trp Lys
                 2580                    2585                    2590
     Cys Met Lys Gly Asp Ser Lys Cys Glu Asn Cys Thr Lys Ala Cys Lys
 20          2595                    2600                    2605
     Asp Tyr Asn Ser Lys Ile Glu Pro Trp Lys Gln Gln Trp Thr Lys Ile
         2610                    2615                    2620
     Lys Glu Lys Tyr Glu Glu Leu Tyr Lys Lys Ala Gln Asn Ser Asp Thr
     2625                    2630                    2635                    2640
 25  Ser Asn Ser Gly Thr Thr Tyr Pro Lys Asp Glu Lys Asp Val Val Ser
                 2645                    2650                    2655
     Phe Leu Ser Lys Leu His Glu Lys Asn Lys Asp Asn Lys Ile Tyr Tyr
                 2660                    2665                    2670
     Thr Ala Ala Gly Tyr Ile His Gln Gln Ala Lys Tyr Leu Asp Cys Thr
 30          2675                    2680                    2685
     Gln Gln Thr His Phe Cys Asp Lys Lys Asn Gly Glu Thr Leu Pro Ser
         2690                    2695                    2700
     Gly Arg Asp Asn Asp Lys Tyr Ala Phe Lys Lys Pro Pro Lys Lys Tyr
     2705                    2710                    2715                    2720
 35  Glu Arg Ala Cys Lys Cys His Glu Lys Gln Glu Pro Pro Pro Pro Lys
                 2725                    2730                    2735
     Val Pro Glu Asp Ser Glu Asp Asp Arg Glu Arg Ser Glu Pro Gly Glu
                 2740                    2745                    2750
     Asp Ala Leu Pro Val Leu Pro Pro Glu Glu Ile Glu Gln Glu Glu Glu
 40          2755                    2760                    2765
     Pro Glu Glu Thr Ser Val Asp Thr Thr Gln Asp Glu Glu Glu Pro Ala
         2770                    2775                    2780
     Ser Glu Gly Gly Gly Pro Ser Gly Ser Pro Thr Glu Glu Ser Gly Glu
     2785                    2790                    2795                    2800
 45  Pro Arg Glu Asn Ser Asp Ser Ser Asp Pro Lys Pro Asp Gln Asn Pro
                 2805                    2810                    2815
     Glu Ala Asn Pro Glu Gln Thr Pro Ile Leu Lys Pro Glu Glu Glu Ala
                 2820                    2825                    2830
     Pro Pro Lys Ser Lys Pro Pro Asp Gly Asp Arg Gly Val Gly Arg Ser
 50          2835                    2840                    2845
     Leu Gly Pro Thr Pro Arg Ser Glu Val Glu Pro Glu Glu Ser Glu Asn
         2850                    2855                    2860
     Glu Asp Val Glu Asp Glu Asp Asp Glu Glu Glu Glu Asp Pro Asp
     2865                    2870                    2875                    2880
 55  Asp Asp Pro Glu Ala Glu Ser Glu Glu Glu Asp Glu Asp His Gly Gly
                 2885                    2890                    2895
     Gln Glu Ala Glu Ala Val Pro Pro Gln Pro Gln Ala Pro Ala Pro Leu
                 2900                    2905                    2910
     Pro Pro Pro Pro Pro Pro Leu Pro Pro Leu Lys Thr Ala Leu Met Ser
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        Ser Thr Ile Met Trp Ser Val Gly Ile Gly Phe Ala Ala Ile Ser Tyr
            2930                    2935                    2940
        Phe Leu Leu Lys Lys Lys Pro Lys Ser Pro Val Asp Leu Ile Arg Val
     5  2945                    2950                    2955            2960
        Ile Asp Ile His Lys Gly Asp Tyr Gly Ile Pro Thr Leu Glu Ser Lys
                    2965                    2970                    2975
        Asn Arg Tyr Ile Pro Tyr Val Ser Asp Thr Tyr Lys Gly Lys Thr Tyr
                        2980                    2985                    2990
    10  Ile Tyr Met Glu Gly Asp Thr Ser Gly Asp Glu Lys Tyr Gly Phe Met
                    2995                    3000                    3005
        Ser Asp Thr Thr Asp Ile Thr Ser Ser Glu Ser Glu Tyr Glu Glu Leu
                3010                    3015                    3020
        Asp Ile Asn Asp Ile Tyr Val Pro Gly Ser Pro Lys Tyr Lys Thr Leu
    15  3025                    3030                    3035            3040
        Ile Glu Val Val Leu Glu Pro Ser Lys Ser Asn Gly Asn Thr Leu Gly
                    3045                    3050                    3055
        Asp Asp Met Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Asn
                    3060                    3065                    3070
    20  Glu Leu Lys His Asp Phe Ile Ser Gln Tyr Ile Gln Ser Glu Pro Leu
                    3075                    3080                    3085
        Asn Val Pro Gln Tyr Asp Val Leu Lys Glu Leu Pro Met Asn Ile Val
                3090                    3095                    3100
        Gly Asn Val Leu Asp Asp Gly Ile Asn Glu Lys Pro Phe Ile Thr Ser
    25  3105                    3110                    3115            3120
        Ile His Asp Arg Asp Leu Asn Ser Gly Glu Glu Ile Ser Tyr Asn Ile
                    3125                    3130                    3135
        Asn Met Ser Thr Asn Ser Met Asp Asp Pro Lys Tyr Val Ser Asn Asn
                    3140                    3145                    3150
    30  Val Tyr Ser Gly Ile Asp Leu Ile Asn Asp Ser Leu Ser Gly Gly Lys
                    3155                    3160                    3165
        Pro Ile Asp Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu
                    3170                    3175                    3180
        Phe Gly Thr Asn Tyr Lys Lys Asn Thr Ser Asn Asn Asn Val Ala Lys
    35  3185                    3190                    3195            3200
        Leu Thr Asn Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Lys
                    3205                    3210                    3215
        Trp Leu Asp Arg His Arg Asp Met Cys Glu Met Trp Asn Asn Lys Glu
                    3220                    3225                    3230
    40  Glu Val Leu Asp Lys Leu Lys Glu Gln Trp Asn Lys Asp Asn Asp Gly
                    3235                    3240                    3245
        Gly Asp Ile Ser Ser Asp Ser Asn Lys Arg Leu Asn Thr Asp Val Ser
                    3250                    3255                    3260
        Ile Glu Ile Asp Met Asp Asp Pro Lys Gly Lys Lys Glu Phe Ser Asn
    45  3265                    3270                    3275            3280
        Met Asp Thr Ile Leu Asp Asn Ile Glu Asp Asp Ile Tyr Tyr Asp Val
                    3285                    3290                    3295
        Asn Asp Glu Asn Pro Ser Val Asn Asp Ile Pro Met Asp His Asn Lys
                    3300                    3305                    3310
    50  Val Asp Val Pro Lys Lys Val His Val Glu Met Lys Ile Leu Asn Asn
                    3315                    3320                    3325
        Thr Ser Thr Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp
                    3330                    3335                    3340
        Asn Ile
    55  3345
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<222>  (0)...(0)
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aaggagcagg cctccaagga cgccaagatc cacggacacc acctgaaggg cgacctggcc  180
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ctggactacc gcttccacac caacgtgtgg cacaggaacg ccgaggacag gaacccctgc  300
ctgttctcca gggccaagcg cttctccaac gagggagagg ccgagtgcaa cggcggcatc  360
atcaccggaa acaagggaga gtgcggcgcc tgcgccccct acaggaggag gcacatctgc  420
gactacaacc tgcaccacat caacgagaac aacatccgca cacccacga cctgctgggc  480
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      Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp
              1650                    1655                    1660
 35   Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro
      1665                    1670                    1675                    1680
      His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu
                  1685                    1690                    1695
      Glu Pro Lys Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val
 40               1700                    1705                    1710
      Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp
              1715                    1720                    1725
      His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp
              1730                    1735                    1740
 45   Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met
      1745                    1750                    1755                    1760
      Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn
                  1765                    1770                    1775
      Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala
 50               1780                    1785                    1790
      Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn
              1795                    1800                    1805
      Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp
              1810                    1815                    1820
 55   Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys
      1825                    1830                    1835                    1840
      Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly
                  1845                    1850                    1855
      Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr
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                    1860                      1865                      1870
         Asn Val Glu Gln Arg Lys Pro Trp Trp Gly Lys Asn Ala Glu Ala Ile
                1875                      1880                      1885
         Trp Asp Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Thr Asn Lys Asn
5            1890                      1895                      1900
         Met Asp Tyr Asn Ala His Thr Lys Leu Asn Pro Thr Tyr Gly Tyr Asn
         1905                      1910                      1915                      1920
         Ala Ile Lys Ser Glu Leu Glu Asp Phe Val Asn Arg Pro Gln Phe Leu
                    1925                      1930                      1935
10       Arg Trp Phe Thr Glu Trp Ser Asp Glu Phe Cys Thr Glu Arg Ser Ile
                1940                      1945                      1950
         Lys Ile Lys Glu Leu Glu Thr Lys Cys Asn Asp Cys Thr Val Ser Glu
                1955                      1960                      1965
         Ser Gly Thr Ser Asp Ala Thr Gly Asn Lys Thr Cys Asp Asp Lys Asp
15           1970                      1975                      1980
         Lys Cys Asp Glu Cys Lys Arg Ala Cys Thr Thr Tyr Lys Thr Trp Leu
         1985                      1990                      1995                      2000
         Lys Asn Trp Lys Thr Gln Tyr Lys Thr Gln Ser Lys Lys Tyr Phe Asp
                    2005                      2010                      2015
20       Asp Lys Arg Lys Glu Leu Tyr Lys Ser Ile Asp Asp Val Ala Ser Ser
                2020                      2025                      2030
         Thr Gln Ala Tyr Gln Tyr Leu His Ala Gln Leu Lys Lys Leu Cys Gly
                2035                      2040                      2045
         Asn Ala Asp Cys Lys Cys Met Asp Gly Glu Ser Lys Glu Thr Thr Gly
25           2050                      2055                      2060
         Gln Pro Asp Asn Ser His Asp Ser His Met Pro Ala Ser Leu Asp Asp
         2065                      2070                      2075                      2080
         Glu Pro Glu Glu Val Asn Gly Lys Cys Asn Cys Lys Val Lys His Arg
                    2085                      2090                      2095
30       Pro Gln Pro Pro Leu Ala Leu Pro Pro Pro Ala Pro Ser Gly Pro Pro
                2100                      2105                      2110
         Ala Glu Asp Gln Ile Glu His Asp Asn Arg Gly Arg Ser Glu Arg Gly
                2115                      2120                      2125
         Asp Gln Gly Pro Leu Pro Ala Arg Pro Pro Pro Pro Gln Ala Ala
35           2130                      2135                      2140
         Gln Pro Pro Gln Pro Lys Pro Lys Arg Thr Gly Glu Gly Leu Gly Arg
         2145                      2150                      2155                      2160
         Asn Leu Pro Pro Ala Asp Arg Asn Thr Asn Leu Ser Asp Ser Glu Glu
                    2165                      2170                      2175
40       Glu Asp Asp Glu Asp Asp Glu Val Gln Glu Glu Glu Thr Pro
                    2180                      2185                      2190
         Pro Ser Glu Ala Glu Glu Gly Glu Gly His Val Glu Thr Glu Glu Glu
                2195                      2200                      2205
         Thr Lys Pro Val Lys Glu Lys Thr Glu Gly Ala Gly Ala Thr Glu Val
45           2210                      2215                      2220
         Thr Lys Gln Gly Ser Ala Pro Thr Ala Thr Thr Pro Thr Val Glu Asp
         2225                      2230                      2235                      2240
         Ile Cys Ala Thr Val Ala Lys Ala Leu Lys Gly Asp Lys Ser Leu Asn
                    2245                      2250                      2255
50       Ala Ala Cys Ala Leu Lys Tyr Gly Lys Asn Asn Ser Arg Leu Gly Trp
                2260                      2265                      2270
         Lys Cys Ile Pro Thr Ser Gly Asp Lys Thr Asp Thr Ser Glu Asn Gly
                2275                      2280                      2285
         Ala Pro Arg Arg Ala Arg Ser Ala His Gly Gly Lys Ser Asp Ser Glu
55           2290                      2295                      2300
         Lys Gly Ser Ile Cys Val Pro Pro Arg Arg Arg Arg Leu Tyr Ile Lys
         2305                      2310                      2315                      2320
         Lys Ile Val Asp Trp Ala Glu Ser Gln Ser Lys Thr Val Thr Ser Val
                    2325                      2330                      2335
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    Asn Gly Asp Gly Asn Gly Ser Gln Glu Val Val Ser Val Asn Gly Ala
              2340               2345               2350
    Ser Glu Ser Gly Gly Ser Gly Ser Gly Thr Glu Ser Gln Ala Ser Asp
              2355               2360               2365
 5  Val Ser Gln Gly Asn Gly Ala Ser Thr Ser Pro Gln Val Ala Leu Leu
              2370               2375               2380
    His Ala Phe Val Lys Ser Ala Ala Ile Glu Thr Phe Phe Ala Trp His
    2385               2390               2395               2400
    Lys Tyr Lys Val Asp Lys Glu Ile Glu Glu Lys Glu Lys Gln Ala Ala
10            2405               2410               2415
    Gln Asn His Leu Val Gln Arg Lys Thr Ser Glu Asn Pro Gln Lys Lys
              2420               2425               2430
    Leu Glu Gly Gly Glu Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr
              2435               2440               2445
15  Thr Leu Gly Asp Tyr Arg Asp Ile Leu Val Gly Asp Lys Thr Met Ile
              2450               2455               2460
    Glu Ala Leu Glu Lys Ser Gly Asp Thr Lys Ile Glu Asp Ile Ser Glu
    2465               2470               2475               2480
    Lys Ile Pro Lys Ile Leu Asp Gly Glu Asn Asn Lys Ala Ala Gly Gly
20            2485               2490               2495
    Gly Pro Lys Gln Pro Asn Ser Gly Lys Thr Pro Gln Glu Trp Trp Lys
              2500               2505               2510
    Glu Asn Ala Lys His Ile Trp His Gly Met Ile Cys Ala Leu Thr Tyr
              2515               2520               2525
25  Asn Thr Asp Ser Asn Gly Lys Asp Lys Lys Ile Gln Gln Val Lys Ala
              2530               2535               2540
    Thr Asp Asn Thr Asp Leu Phe Gln Lys Leu Lys Lys Asp Asn Asp Tyr
    2545               2550               2555               2560
    Glu Thr Val Ser Phe Gly Ala Ser Gly Thr Gly Ala Lys Ser Asn Asp
30            2565               2570               2575
    Asp Thr Lys Leu Lys Asn Phe Val Val Arg Pro Thr Tyr Phe Arg Trp
              2580               2585               2590
    Leu Glu Glu Trp Gly Glu Glu Phe Cys Arg Lys Gln Lys His Lys Leu
              2595               2600               2605
35  Tyr Ile Ile Lys Lys Asp Cys Arg Asp Asn Lys Phe Cys Ser Gly Asp
              2610               2615               2620
    Gly Leu Arg Cys Asp Glu Lys Val Pro Asp Lys Lys Asp Ile Phe Lys
    2625               2630               2635               2640
    His Phe Asp Cys Pro Ser Cys Ala Arg His Cys Arg Ser Tyr Arg Lys
40            2645               2650               2655
    Trp Ile Glu Arg Lys Lys Thr Glu Tyr Glu Lys Gln Glu Ser Ala Tyr
              2660               2665               2670
    Ser Lys Gln Lys Ser Asn Tyr Val Asn Gly Ser Asn Gly Asp Gly Gly
              2675               2680               2685
45  Asn Asn Asn Asp Lys Glu Phe Tyr Thr Lys Leu Glu Thr Cys Thr Lys
              2690               2695               2700
    Ala Thr Asn Phe Leu Glu Ser Leu Lys Gly Gln Cys Ile Gly Asn Asn
    2705               2710               2715               2720
    Asn Gly Gly Thr Asp Ile Lys Phe Ser Asn Thr Asn Ile Thr Phe Gly
50            2725               2730               2735
    Ser Ala Glu Asp Cys Lys Pro Cys Ser Glu Phe Lys Val Asn Cys Glu
              2740               2745               2750
    Asn Gly Ser Cys Gly Ser Ala Lys Gln Lys Asp Cys Pro Asn Asn Thr
              2755               2760               2765
55  Ile Thr Ser Gln Asn Ile Lys Gly Leu Thr Asp Gln Val Asp Met Arg
              2770               2775               2780
    Val Ser Asp Asn Thr Glu Ser Gly Phe Glu Gly Asp Leu Gly Ile Cys
    2785               2790               2795               2800
    Gln Gly Ala Gly Ile Phe Lys Gly Ile Arg Lys Asp Glu Trp Lys Cys
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                         2805                    2810                     2815
     Gly Asp Phe Cys Gly Ile Asp Ile Cys Thr Leu Glu Lys Thr Asn Asn
                    2820                    2825                     2830
     Gly Lys Glu Ser Asp Lys Lys Tyr Ile Ile Met Lys Glu Phe Val Lys
  5          2835                    2840                     2845
     Arg Trp Leu Glu Tyr Phe Phe Glu Asp Tyr Asn Arg Ile Gln Lys Lys
          2850                    2855                     2860
     Leu Lys Thr Cys Lys Glu Asn Gly Lys Gly Ser Thr Cys Ile Arg Ser
     2865                    2870                    2875                     2880
 10  Cys Val Asp Glu Trp Ile Lys Leu Lys Lys Asp Glu Trp Gln Lys Ile
                    2885                    2890                     2895
     Asn Ser Asn Tyr Leu Asp Gln Asn Thr Lys Glu Asn Pro Glu Gly Asn
                    2900                    2905                     2910
     Asn Leu Ser Ser Phe Leu Glu Asp Gly Pro Phe Lys Asn Glu Val Asp
 15          2915                    2920                     2925
     Lys Ala Ile Lys Pro Cys Gly Asn Leu Thr Asp Phe Lys Lys Ser Lys
          2930                    2935                     2940
     Lys Cys Asn Gly Thr Ser Arg Ser Gly Asn Ser Glu Glu Ser Thr Lys
     2945                    2950                    2955                     2960
 20  Tyr Asp Gly Val Ile Cys Leu Leu Asp Asn Leu Lys Asn Ile Ile Lys
                    2965                    2970                     2975
     Thr Cys Gln Asn Val Pro Ser Gly Lys Pro Asp Thr Pro Cys Gln Lys
                    2980                    2985                     2990
     Ser Pro Ala Pro Val Gly Asp Asp Asp Pro Leu Glu Glu Glu Asn
 25          2995                    3000                     3005
     Pro Val Thr Gln Pro Asn Ile Cys Pro Gln Thr Ser Val Glu Glu Lys
          3010                    3015                     3020
     Lys Lys Glu Glu Glu Glu Lys Cys Asp Glu Lys Glu Glu Glu Glu Glu
     3025                    3030                    3035                     3040
 30  Lys Glu Glu Glu Lys Asp Lys Gly Asp Glu Glu Val Lys Glu Glu Glu
                    3045                    3050                     3055
     Lys Asp Lys Gly Asp Glu Glu Glu Glu Ala Glu Glu Glu Glu Glu Glu
                    3060                    3065                     3070
     Glu Glu Glu Thr Asp Ser His Ile Tyr Glu Asp Tyr Ser Asp Ser Asp
 35          3075                    3080                     3085
     Ala Glu Glu Asp Asp Glu Asp Glu Ala Val Thr Glu Ser Leu Ser Pro
          3090                    3095                     3100
     Ser Glu Ser Gln Pro Lys Arg Leu Leu Arg Glu Phe Pro Ser Pro Glu
     3105                    3110                    3115                     3120
 40  Leu Lys Asn Ala Met Leu Phe Ser Thr Ile Leu Trp Met Val Gly Ile
                    3125                    3130                     3135
     Gly Phe Ala Ala Phe Thr Tyr Phe Phe Leu Lys
                    3140                    3145
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